WHAT IS CLAIMED IS:

1. A method comprising improving a pellicle property by subjecting a pellicle polymer material to a technique that increases fluorine atoms in or on the pellicle polymer.

2. The method of claim 1, wherein the pellicle property is selected from the group consisting of optical transmission, durability, and a combination thereof.

3. The method of claim 1, wherein the technique is selected from the group consisting of ion beam fluorination, plasma fluorination, atomic layer deposition, and remote plasma deposition.

4. A pellicle polymer made by a process comprising: subjecting a pellicle polymer material to a technique that increases fluorine atoms in or on the pellicle polymer.

5. The pellicle polymer of claim 4, wherein the technique is selected from the group consisting of ion beam fluorination, plasma fluorination, atomic layer deposition, and remote plasma deposition.

6. A polymer pellicle made by a process comprising subjecting a PVDF, a Teflon AF, or a CTYOP material to ion beam fluorination, plasma fluorination, atomic layer deposition, and/or remote plasma deposition to provide PVDF, Teflon AF or CYTOP having improved properties.

7. The polymer pellicle of claim 6, wherein the improved property is selected from the group consisting of optical transmission, durability, and a combination thereof.

8. The polymer pellicle of claim 7, wherein the durability is improved at 157 nm wavelength compared to standard PVDF, Teflon AF, or CYTOP.

9. A polymer material subjected to ion beam fluorination, plasma fluorination, atomic layer deposition, and/or remote plasma deposition to improve the polymer material's optical properties, durability, and/or friction properties, wherein the optical properties, durability and/or friction properties are improved compared to a polymer material that is not subjected to ion beam fluorination, plasma fluorination, atomic layer deposition, and/or remote plasma deposition.

10. The polymer material of claim 9, wherein the optical properties and durability are improved at 157 nm compared to polymer material that is not subjected to ion beam fluorination, plasma fluorination, atomic layer deposition, and/or remote plasma deposition.

11. A fluorinated polymer made by a process comprising

fluorinating an amorphous fluoropolymer by a method selected from ion beam fluorination, plasma fluorination, atomic layer deposition, and remote plasma deposition, wherein the amorphous fluoropolymer is further fluorinated.

12. The fluorinated polymer of claim 11, wherein the process results in the surface deposition of fluorine atoms or fluorine containing groups.

13. A pellicle film comprising a fluorine-containing polymer wherein the fluorine content of the pellicle film is increased by surface deposition of fluorine atoms or fluorine containing groups.

14. The pellicle film of claim 13, wherein the fluorine content is increased by depositing fluorine ions onto the pellicle surface.

15. The pellicle film of claim 14, wherein the fluorine ions are generated in a technique selected from the group consisting of ion beam fluorination, plasma fluorination, atomic layer deposition, and remote plasma deposition.